

# STA-RITE®

## DURA-JET™ PUMP

### O W N E R ' S M A N U A L



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#### INSTALLATION, OPERATION & PARTS

#### MODELS

1/2 HP	3/4 HP	3/4 HP (2-Speed)	1 HP	1 HP (2-Speed)	1-1/2 HP
JSACL	JSADL JSADL-2A	JSAYDL	JSAEL JSAEL-2A	JSAYEL	JSAFL JSAEFL JSAYFL

This manual should be given to the end user of this pump; its use will reduce service calls and chance of injury and will lengthen pump life.

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S196 (Rev. A)

# DURA-JET SPA PUMP

To avoid unneeded service calls, prevent possible injuries, and get the most out of your pump, READ THIS MANUAL CAREFULLY!

The Sta-Rite 'JS' Series Tub Pump:

- Is designed to circulate hot water in spas and hot tubs.
- Is an excellent performer; durable, reliable.

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# IMPORTANT SAFETY INSTRUCTIONS

Always follow basic safety precautions with this equipment, including the following.

**⚠ WARNING** To reduce the risk of injury, do not permit children to use this product unless they are closely supervised at all times.

**⚠ CAUTION** This pump is for use with permanently installed pools and may also be used with hot tubs and spas if so marked. Do not use with storable pools. A permanently installed pool is constructed in or on the ground or in a building such that it cannot be readily disassembled for storage. A storable pool is constructed so that it may be readily disassembled for storage and re-assembled to its original integrity.

# SAVE THESE INSTRUCTIONS

# READ AND FOLLOW ALL INSTRUCTIONS!

**⚠** This is the safety alert symbol. When you see this symbol on your system or in this manual, look for one of the following signal words and be alert to the potential for personal injury.

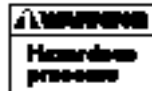
**⚠ DANGER** warns about hazards that will cause death, serious personal injury, or major property damage if ignored.

**⚠ WARNING** warns about hazards that can cause death, serious personal injury, or major property damage if ignored.

**⚠ CAUTION** warns about hazards that will or can cause minor personal injury or property damage if ignored.

NOTICE indicates special instructions not related to hazards.

Carefully read and follow all safety instructions in this manual and on equipment. Keep safety labels in good condition; replace if missing or damaged.



Incorrectly installed or tested equipment may fail, causing severe injury or property damage. Read and follow instructions in owner's manual when installing and operating equipment. Have a trained pool professional perform all pressure tests.

1. Do not connect system to a high pressure or city water system.
2. Use equipment only in a pool or spa installation.
3. Trapped air in system can cause explosion. BE SURE all air is out of system before operating or testing equipment.

Before pressure testing, make the following safety checks:

- Check all clamps, bolts, lids, and system accessories before testing.
- Release all air in system before testing.
- Tighten Sta-Rite trap lids to 30 ft. lbs. (4.1 kg-cm) torque for testing.
- Water pressure for test must be less than 25 PSI (172 kPa).
- Water Temperature for test must be less than 100° F. (38° C).
- Limit test to 24 hours. After test, visually check system to be sure it is ready for operation. Remove trap lid and retighten hand tight only.

NOTICE: These parameters apply to Sta-Rite equipment only. For non-Sta-Rite equipment, consult manufacturer.

# INSTALLATION

Installation and wiring of pump should only be done by qualified, licensed personnel.

Pump mount must:

Be Solid - Level - Rigid - Vibration free. (To reduce vibration and pipe stress, bolt pump to mount.)

Be installed with pump suction inlet below water level at all times (this allows pump to prime).

Be installed with pump discharge below water level at all times (to avoid trapped air in discharge line).

Allow discharge line to be level or slope slightly up to heater, spa, or pool.

Have adequate drainage to prevent flooding.

Be protected from excess moisture.

Allow adequate access for servicing pump and piping.

**Ventilation:**

Provide adequate ventilation to prevent motor overheating.

For continuous running, motor hot air exhaust must be able to escape motor compartment.

**Piping:**

Use flexible or rigid PVC pipe for connections to pump.

Suction/discharge piping gate valves will allow removal for servicing.

Use at least 1-1/2" IPS pipe.


Fittings restrict flow; for best efficiency use fewest possible fittings.

Pump will not prime if suction pipe leaks.

Unions are provided. Use as follows for leak-free connections to pump:

1. 'O' Ring and sealing surfaces must be clean.
2. Assemble handtight only! (NO WRENCHES!)
3. NO pipe compound or Teflon tape on unions.
4. Bond pipe to unions with PVC cement.

 **WARNING**

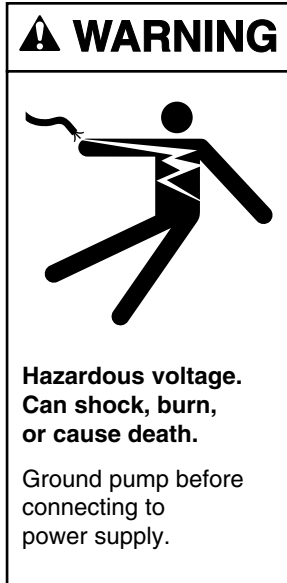
 Use PVC cement only in a well ventilated area away from flame; FOLLOW MANUFACTURER'S INSTRUCTIONS!

**Spa Fittings:**

Size and number of jets will have a major effect on jet action.

Typical installations use up to four 7/8" or 3/4" diameter jets or up to seven 1/2" diameter jets.

Spa fittings must meet International Association of Plumbing and Mechanical Officials (IAPMO) standards. Use only non-entrapping suction fitting or double suction.



## ELECTRICAL

- ⚠ Ground motor before connecting to electrical power supply! Failure to ground pump motor can cause serious or fatal electrical shock hazard!
- ⚠ Do not ground to a gas supply line!
- ⚠ To avoid dangerous or fatal electrical shock, turn OFF power to motor before working on electrical connections.
- ⚠ GFCI tripping indicates an electrical problem. If GFCI trips and will not reset, have a qualified electrician inspect and repair electrical system.
- ⚠ Exactly match supply voltage to nameplate voltage (115 Volt or 230 Volt single phase only)! Incorrect voltage can cause fire or seriously damage motor and voids warranty!

### Grounding:

Install, ground, and wire motor according to local or National Electrical Code requirements.

Permanently ground motor; use size and type wire required by code.

Ground connection must be made to green grounding terminal under motor canopy or access plate (see Figure 1B).

Connect motor ground terminal to electrical service ground.

Install and bond pump according to local codes and ordinances; use bonding lug on motor (see Figure 1A). Use solid copper conductor No. 8 AWG (8.4mm<sup>2</sup>) or larger.

### Wiring:

Pump must be permanently connected to circuit. Table I, Page 6, gives correct wire and circuit breaker sizes for the pump alone. If other lights or appliances are also on the same circuit, be sure to add their amp loads to pump amp load before figuring wire and circuit breaker sizes. (If unsure how to do this or if this is confusing, consult a licensed electrician.) Use the load circuit breaker as the master on-off switch.

Install a Ground Fault Circuit Interrupter (GFCI) in circuit; it will sense a short-circuit to ground and disconnect power before it becomes dangerous to pool users. For size of GFCI required and test procedures for GFCI, see manufacturer's instruction.

In case of power outage, check GFCI for tripping (which will prevent normal pump operation). Reset if necessary.

**NOTICE:** If you do not use conduit when wiring motor, be sure to seal wire opening on end of motor to prevent dirt, bugs, etc., from entering.

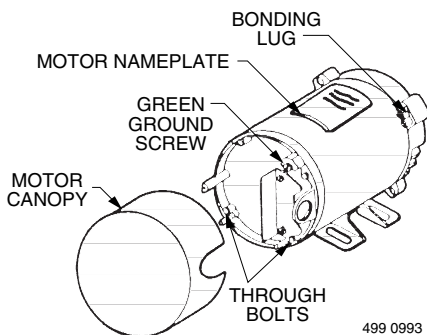


Figure 1A: Typical ground screw and bonding lug locations.

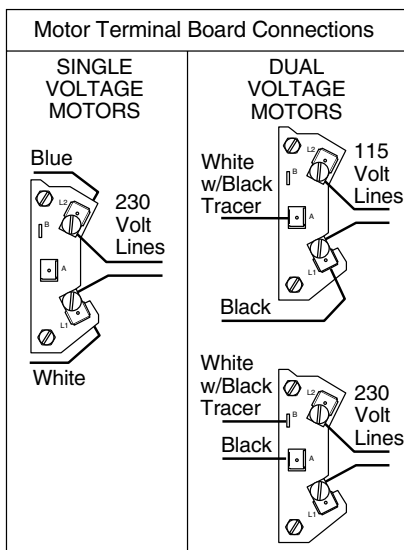


Figure 1B. Motor terminal block connections.

### Voltage:

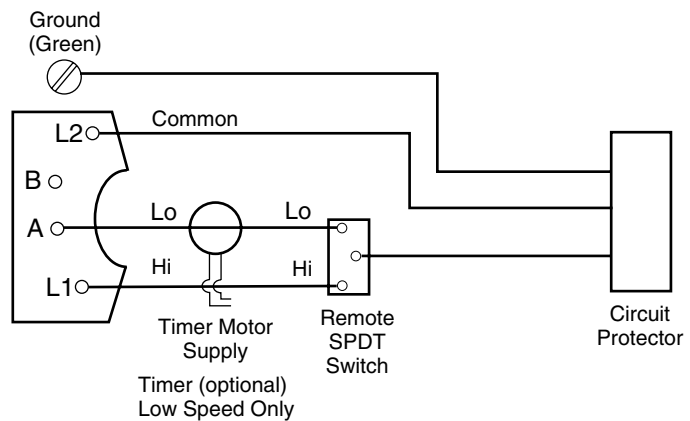
Voltage at motor must be not more than 10% above or below motor nameplate rated voltage or motor may overheat, causing overload tripping and reduced component life. If voltage is less than 90% or more than 110% of rated voltage when motor is running at full load, consult power company.

**⚠** Values given in tables below are for PUMP MOTOR ONLY. If additional spa accessories are installed on pump motor circuit (heater, blower, etc.), include their amperage draw when figuring wire and circuit breaker sizes.

TABLE I - RECOMMENDED CIRCUIT BREAKER SIZE AND WIRING DATA FOR 60 Hz MOTORS

Model No.	Motor HP	Volts	Full Load Amps	Branch Circuit Breaker Amp Rating	AWG (mm <sup>2</sup> ) Wire Gauge Size			Temp Deg. C.
					Dist in Ft. (M) - Service to Motor			
					0-100 (0-30)	101-200 (31-60)	201-300 (61-90)	
<b>Single Speed Pumps:</b>								
JSACL-A	1/2	115	7.0	15	14 (2.0)	12 (3.0)	10 (5.5)	75
JSADL-2A	3/4	115	9.0	15	14 (2.0)	14 (2.0)	10 (5.5)	75
JSAEL-2A	1	115	12.0	15	14 (2.0)	10 (5.5)	8 (8.4)	75
JSAFL-A	1-1/2	115/230	16.4/8.2	25/15	10/14 (5.5/2.0)	8/14 (8.4/2.0)	6/12 (14/3.0)	75
JSAEFL-A	1-1/2	115/230	14.4/7.2	20/15	12/14 (3.0/2.0)	8/14 (8.4/2.0)	6/14 (14/2.0)	75
JSADL-230A	3/4	230	4.8	15	14 (2.0)	14 (2.0)	14 (2.0)	75
JSAEL-230A	1	230	6.1	15	14 (2.0)	14 (2.0)	14 (2.0)	75
<b>Two Speed Pumps:</b>								
JSAYDL-A	3/4-1/8	115	9.0/2.7	15	14 (2.0)	12 (3.0)	10 (5.5)	75
JSAYDL-LA	3/4-1/8	115	9.0/2.7	15	14 (2.0)	12 (3.0)	10 (5.5)	75
JSAYEL-A	1-1/6	115	11.7/3.4	15	14 (2.0)	10 (5.5)	8 (8.4)	75
JSAYEL-LA	1-1/6	115	12.0/3.3	15	14 (2.0)	10 (5.5)	8 (8.4)	75
JSAYFL-LA	1 <sup>1</sup> / <sub>4</sub> - 1/6	115	16.6/3.6	25	10 (5.5)	8 (8.4)	6 (14)	75
JSAYDL-230A	3/4-1/8	230	4.7/1.4	15	14 (2.0)	14 (2.0)	14 (2.0)	75
JSAYEL-230A	1-1/6	230	6.3/1.8	15	14 (2.0)	14 (2.0)	14 (2.0)	75
JSAYFL-230A	1 <sup>1</sup> / <sub>4</sub> - 1/6	230	8.1/1.7	15	14 (2.0)	14 (2.0)	12 (3.0)	75
JSAYDL-220A	3/4-1/8	220	5.4/1.4	15	14 (2.0)	14 (2.0)	14 (2.0)	75
JSAYEL-220A	1-1/6	220	6.3/1.8	15	14 (2.0)	14 (2.0)	14 (2.0)	75

### Remote Switching For 2-Speed Pumps



Minimum switch and timer amp rating must equal Branch Fuse Rating given in "Recommended Circuit Breaker Size and Wiring Data" table.

## OPERATION



### Priming Pump:

- ⚠ NEVER run pump dry! Running pump dry may damage seals, causing leakage and flooding! Fill pump with water before starting motor.
- ⚠ Do not add chemicals to spa system directly in front of pump suction. Adding undiluted chemicals may damage pump and voids warranty.

Open gate valves before starting system.

Pump will prime itself when used in flooded suction system.

Be sure to release all air from filter and piping system; see spa/filter owner's manual.

On two speed models, low speed is used for filtration and heating; high speed provides therapy jet action.

- ⚠ Do not block pump suction! To do so with body may cause severe or fatal injury. Small children using spa must ALWAYS have close adult supervision!

NOTICE: Do not block jets! To do so may flood area causing damage to equipment and water damage to surrounding area.



### Water:

Keep water level at least two inches above bottom of skimmer opening when system is not in use. Failure to do so can allow air to enter system, causing pump to lose its prime.

Keep water temperature at 104°F (40°C) or below.

Age or health conditions may require a lower temperature; consult a physician for more information.

If in doubt, start at a lower temperature and gradually increase it according to your experience.

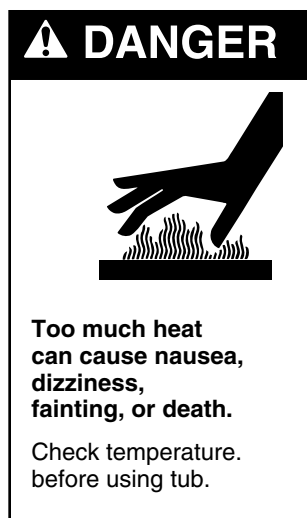
Keep an accurate thermometer in bath; check it before getting in.

- ⚠ Do not use or allow the use of the tub by anyone using alcohol or drugs. The effects of hot water, alcohol and/or drugs can cause dizziness and falling, loss of consciousness, or heart attack.
- ⚠ A long bath in hot water may cause hyperthermia (too much heat in the body) which can be fatal. Some symptoms of hyperthermia are:
  - Nausea
  - Dizziness
  - Fainting

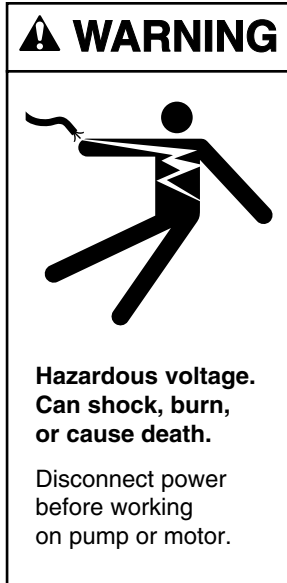
If these symptoms appear while in the spa, GET OUT AT ONCE!

Cool the body at once with cold towels or a cool shower.

Call a doctor if symptoms do not go away.



## PUMP SERVICE



Pump should only be serviced by qualified personnel.

**⚠** To avoid dangerous or fatal electrical shock hazard, disconnect power to motor before working on pump or motor!

No lubrication or regular maintenance are needed.

If shaft seal is damaged, repair as follows:

### Removing Old Seal:

1. Disconnect power to pump motor.
2. Drain tub and pump; disconnect unions to allow access to pump.
3. Remove six bolts holding front plate to seal plate; remove front plate.
4. Remove shaft cover or motor canopy; using screwdriver in slot on motor end of shaft or wrench on flats of shaft extension, hold pump shaft and unscrew impeller from shaft (turn counterclockwise). Rotating half of seal will come off with impeller.
5. Carefully remove rotating part of seal from impeller sleeve by pulling and turning on sealing washer and spring (Figure 2). Do not damage impeller surface where drive ring seats and seals.
6. Carefully remove four motor throughbolts from seal plate (Figure 3); remove seal plate and use a screwdriver to tap ceramic seat out from the rear (Figure 4). Do not damage seal cavity in seal plate.
7. Clean cavity from which seal was removed and clean motor shaft.



Figure 2



Figure 3



Figure 4

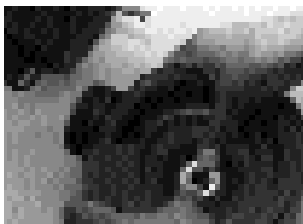


Figure 5

### Installing New Seal:

1. Ceramic seat must be clean and free of dirt, grease, dust, etc. Wet rubber cup gasket of ceramic seat with small amount of water; press into cavity firmly and squarely with finger pressure (Figure 5).
2. If ceramic seat will not locate properly, remove it, place face up on bench, and reclean cavity. Ceramic seat should now locate.
3. Seal must be free of dirt, grease, grit, scratches or chips; be sure impeller sleeve is clean. Slide seal assembly, rubber drive ring first, onto impeller sleeve until drive ring bottoms on impeller back shroud.
4. Slip slinger over shaft; remount seal plate. Torque throughbolts to 25 inch-lbs. (29 cm-kg).



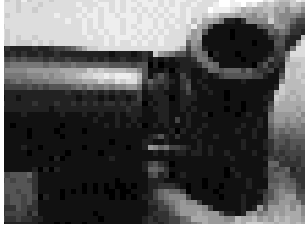


Figure 6

5. Screw impeller onto shaft until it seats against shaft shoulder. Work slinger over end of impeller sleeve so it rides on sleeve (Figure 6).
6. Remount front plate; using pattern, shown in Figure 7, torque bolts to 30 inch-lbs. (34.5 cm-kg). BE SURE to start with bolt in 3 o'clock position as shown.
7. Reconnect unions; tighten hand tight only.

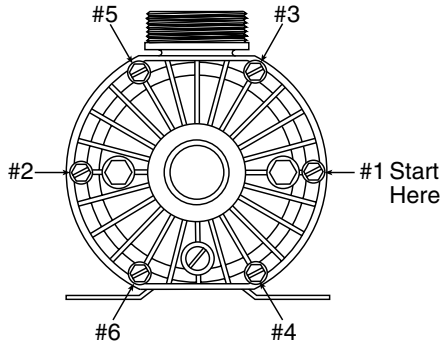


Figure 7 – Torque Sequence



## STORAGE/WINTERIZING

⚠ To prevent damage to components from fumes, store spa chemicals away from pump and spa. If possible, store chemicals in another room.

⚠ Allowing pump to freeze will damage pump and void warranty!

Drain all water from pump and piping when expecting freezing temperatures or when storing pump for a long time (see instructions below).

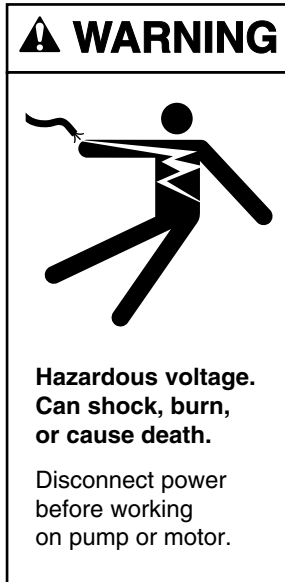
Keep motor dry and covered during storage.

To avoid condensation/corrosion problems, do not cover or wrap pump with plastic.

For outdoor/unprotected pump installations:

1. Enclose entire system in a weatherproof enclosure.
2. To avoid corrosion damage, allow ventilation; do not wrap system in plastic.

Follow spa manufacturer's directions for storage of spa.



### Draining Pump:

**⚠** To avoid dangerous or fatal electrical shock hazard, turn OFF power to motor before draining pump.

NOTICE: Do not use anti-freeze solutions (except propylene glycol) in your spa system. Most anti-freezes are highly toxic and may damage plastic components in the system. Propylene glycol is non-toxic and will not damage pump components.

1. Close all valves on suction and return piping.
2. Remove drain plug in bottom of front plate.
3. Drain all piping and storage tanks exposed to freezing temperatures.
4. Be sure no airlocks are holding water in system.
5. Consult spa and filter owner's manuals for instructions about draining the rest of the system.

NOTICE: We recommend a drain plug or valve at the low point of the spa piping to help drain spa system.

6. Before restarting, replace all plugs and make sure all pipe connections are tightly sealed.


### Startup for Winterized Equipment:

1. Remove any temporary weather protection placed around system for shutdown.
2. Follow filter manufacturer's instructions for reactivation of the filter.
3. Inspect all electrical wiring for damage or deterioration over the shutdown period. Have a qualified serviceman repair/replace wiring as needed. Inspect and tighten all watertight connections.
4. Open all valves in suction and return piping.
5. Remove all winterizing plugs in spa system.
6. Remove all anti-freeze solutions from system.
7. Close all drain valves and replace all drain plugs in spa system.
8. Fill spa with water to proper level (see spa manufacturer's instructions).



**WARNING**

## TROUBLESHOOTING GUIDE

 Read and understand safety and operating instructions in this manual before doing any work on pump!

### A. PUMP DOES NOT OPERATE

1. Check GFCI for proper operation according to GFCI manufacturer's instructions.
2. Check for plugged impeller. Follow disassembly/assembly instructions under "Pump Service", Page 8.
3. Consult dealer/installer or service representative.

### B. IMPROPER JET ACTION

1. Check for blocked fittings. Blocked fittings will cause poor flow and poor jet action.
2. Consult dealer/installer or service representative.

### C. EXCESSIVE AIR IN SYSTEM – PUMP LOSES PRIME

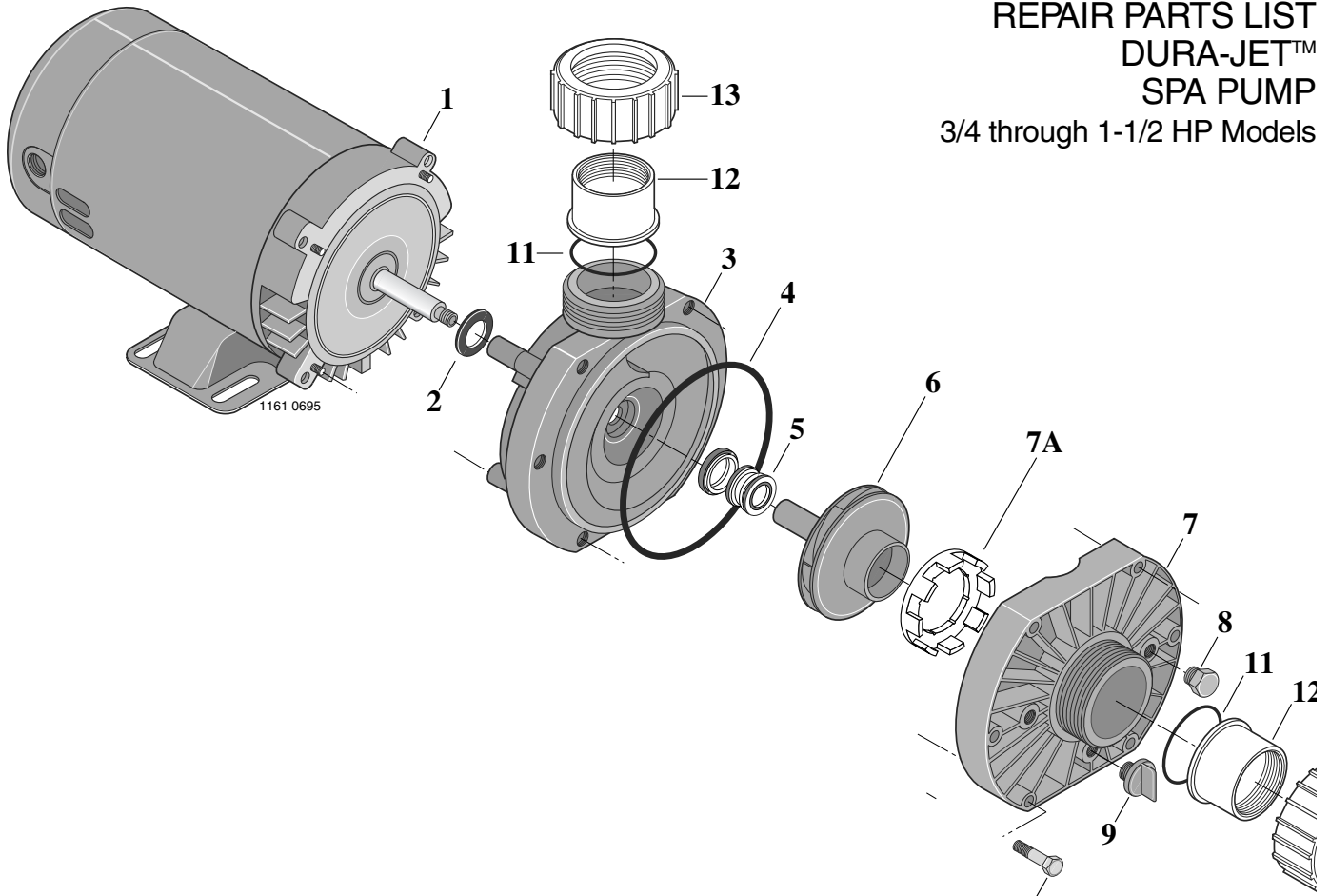
1. Make sure water level in spa is at least 2" (51 mm) above top of jets with system not operating.
2. Make sure there are no leaks in suction piping.
3. Make sure there is no vortex (whirlpool) at the suction.
4. Consult dealer/installer or service representative.

### D. CIRCUIT BREAKER IN HOME PANEL TRIPS REPEATEDLY

1. Breaker must be of adequate capacity.
2. For GFCI breaker: test according to GFCI manufacturer's instructions.
3. Make sure no other lights and appliances are on circuit.
4. Consult dealer/installer or service representative.

# REPAIR PARTS LIST DURA-JET™ SPA PUMP

3/4 through 1-1/2 HP Models



Key No.	Description	Qty.	Part Number
1	Motor	1	Chart at Right
2	Slinger	1	17351-0009
3	Seal Plate	1	C1-260P
4	"O" Ring	1	U9-357
5	Seal	1	37400-0027S
6	Impeller	1	Chart at Right
7	Front Plate	1	C101-262P
8	Pipe Plug	2	WC78-40T
9	Drain Plug	1	U178-920P
10	Screw, 1/4-20x1-3/4	6	30787-0005
11	"O" Ring,	2	U9-226
12	Adapter, Union	2	U11-183P1
13	Collar, Union	2	U11-182P1
	• Nameplate	1	U33-155
	• Decal - "For Use with Pools and Spas"	1	U27-635
	• Voltage Label - 230V(-230A)	1	U27-68
	• Voltage Label - 115V (-A, -AA, -LA)	1	U27-67
	• Voltage Label - 115/230V*	1	U27-153
	• Warning Tag	1	C63-12
	• Warning Tag	1	C63-13

• Not illustrated. \* JSAFL-A, JSAEFL-A only.

Parts are common to all models listed except as noted; Key Nos. 1, Motor; and 8, Impeller, are listed below.

Model No.	HP	Motor No. (Key No. 1)	Impeller No. (Key No. 6)
115 Volt Single Speed			
JSACL-A	1/2	AS900CLL	C105-228PC
JSADL-2A	3/4	AS920DLL	C105-228PB
JSAEL-2A	1	AS920ELL	C105-228P
115 Volt Two Speed			
JSAYDL-A	3/4	AS900DLL-Y	C105-228PB
JSAYEL-A	1	AS900ELL-Y	C105-228P
115 Volt Two Speed (Low Speed Start)			
JSAYDL-LA	3/4	A910DSSL-Y	C105-228PB
JSAYEL-LA	1	A910ESLL-Y	C105-228P
JSAYFL-LA	1 <sup>1</sup> / <sub>4</sub>	A910FSLL-Y	17301-0101
115/230 Volt Single Speed			
JSAFL-A	1 <sup>1</sup> / <sub>4</sub>	A910FLL	17301-0101
JSAEFL-A	1 <sup>1</sup> / <sub>4</sub>	AE910FLL	17301-0101
230 Volt Single Speed			
JSADL-230A	3/4	AS923DL	C105-228PB
JSAEL-230A	1	AS923EL	C105-228P
230 Volt Two Speed			
JSAYDL-230A	3/4	AS923DL-Y	C105-228PB
JSAYEL-230A	1	AS923EL-Y	C105-228P
JSAYFL-230A	1 <sup>1</sup> / <sub>4</sub>	A923FLL-Y	17301-0101
220 Volt Two Speed			
JSAYDL-220A	3/4	62003-2004	C105-228PB
JSAYEL-220A	1	62003-2005	C105-228P







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